

## SEQUENCE LISTING



#6

<110> MIZUTANI, Masako  
TANAKA, Yoshikazu  
KUSUMI, Takaaki  
SAITO, Kazuki  
YAMAZAKI, Mami  
ZHIZHONG, Gong

<120> GENES ENCODING PROTEINS HAVING TRANSGLYCOSYLATION ACTIVITY

<130> 001560-350

<140> 09/147,955  
<141> 1999-03-24

<150> PCT/JP98/03199  
<151> 1998-07-16

<150> JP 9-200571  
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<170> PatentIn Ver. 2.0

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Ala Gln Gly His Ile Asn Pro Ala Leu Gln Phe Ala Lys Arg Leu Leu  
15 20 25

aaa gcc ggc act gac gtc aca ttt ttc acg acg gtt tat gca tgg cgc 148  
Lys Ala Gly Thr Asp Val Thr Phe Thr Ser Val Tyr Ala Trp Arg  
30 35 40

cgc atg gcc aac aca gcc tcc gcc gct gcc gga aac cca ccc ggc ctc 196  
Arg Met Ala Asn Thr Ala Ser Ala Ala Gly Asn Pro Pro Gly Leu  
45 50 55 60

gac ttc gtg gcg ttc tcc gac ggc tac gac gac ggg ctg aag ccc tgc 244  
Asp Phe Val Ala Phe Ser Asp Gly Tyr Asp Asp Gly Leu Lys Pro Cys  
65 70 75

ggc gac ggg aag cgc tac atg tcc gag atg aaa gcc cgc ggc tcc gag 292  
Gly Asp Gly Lys Arg Tyr Met Ser Glu Met Lys Ala Arg Gly Ser Glu  
80 85 90

gcc tta aga aac ctc ctt ctc aac aac cac gac gtc acg ttc gtc gtc 340

Ala Leu Arg Asn Leu Leu Leu Asn Asn His Asp Val Thr Phe Val Val			
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Tyr Ser His Leu Phe Ala Trp Ala Ala Glu Val Ala Arg Glu Ser Gln			
110	115	120	
gtc ccg agc gcc ctt ctc tgg gtc gag ccc gcc acc gtg ctg tgc ata			436
Val Pro Ser Ala Leu Leu Trp Val Glu Pro Ala Thr Val Leu Cys Ile			
125	130	135	140
tat tac ttc tac ttc aac ggc tac gca gac gag atc gac gcc ggt tcc			484
Tyr Tyr Phe Tyr Phe Asn Gly Tyr Ala Asp Glu Ile Asp Ala Gly Ser			
145	150	155	
gac gaa att cag ctc cct cgg ctt cca ccc ctg gag cag cgc agt ctt			532
Asp Glu Ile Gln Leu Pro Arg Leu Pro Pro Leu Glu Gln Arg Ser Leu			
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ccg acc ttt ctg ctg ccg gag aca ccg gag aga ttc ccg ttg atg atg			580
Pro Thr Phe Leu Leu Pro Glu Thr Pro Glu Arg Phe Arg Leu Met Met			
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aag gag aag ctg gaa act tta gac ggt gaa gag aag gcg aaa gtg ttg			628
Lys Glu Lys Leu Glu Thr Leu Asp Gly Glu Glu Lys Ala Lys Val Leu			
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gtg aac acg ttt gat gcg ttg gag ccc gat gca ctc acg gct att gat			676
Val Asn Thr Phe Asp Ala Leu Glu Pro Asp Ala Leu Thr Ala Ile Asp			
205	210	215	220
agg tat gag ttg atc ggg atc ggg ccg ttg att ccc tcc gcc ttc ttg			724
Arg Tyr Glu Leu Ile Gly Ile Gly Pro Leu Ile Pro Ser Ala Phe Leu			
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gac ggc gga gat ccc tcc gaa acg tct tac ggc ggc gat ctt ttc gaa			772
Asp Gly Gly Asp Pro Ser Glu Thr Ser Tyr Gly Gly Asp Leu Phe Glu			
240	245	250	
aaa tcg gag gag aat aac tgc gtg gag tgg ttg gac acg aag ccg aaa			820
Lys Ser Glu Glu Asn Asn Cys Val Glu Trp Leu Asp Thr Lys Pro Lys			
255	260	265	
tct tcg gtg gtg tat gtg tcg ttt ggg agc gtt ttg agg ttt cca aag			868
Ser Ser Val Val Tyr Val Ser Phe Gly Ser Val Leu Arg Phe Pro Lys			
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ttt tta tgg atg ata cga gaa cag aag aat gac gac ggc gaa gaa gaa			964
Phe Leu Trp Met Ile Arg Glu Gln Lys Asn Asp Asp Gly Glu Glu Glu			
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Glu Glu Glu Leu Ser Cys Ile Gly Glu Leu Lys Lys Met Gly Lys Ile			
320	325	330	
gtt tcg tgg tgc tcg cag ttg gag gtt ctg gcg cac cct gcg ttg gga			1060
Val Ser Trp Cys Ser Gln Leu Glu Val Leu Ala His Pro Ala Leu Gly			
335	340	345	

tgt ttc gtg acg cat tgt ggg tgg aac tcg gct gtg gag agc ttg agt Cys Phe Val Thr His Cys Gly Trp Asn Ser Ala Val Glu Ser Leu Ser 350 355 360	1108
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atg aat gaa ggg ggt ggg gtt gat gga tct gag ata gag agg tgt gtg Met Asn Glu Gly Gly Val Asp Gly Ser Glu Ile Glu Arg Cys Val 400 405 410	1252
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gcc ata aaa tgg aag act ttg gcc aga gaa gcc atg gga gag gat gga Ala Ile Lys Trp Lys Thr Leu Ala Arg Glu Ala Met Gly Glu Asp Gly 430 435 440	1348
tct tca ctc aag aat ctc aac gcc ttt ctt cat caa gtt gca cgt gct Ser Ser Leu Lys Asn Leu Asn Ala Phe Leu His Gln Val Ala Arg Ala 445 450 455 460	1396
taatacacaa aatggcttca cactttaat ctactcaaac accggttcaa ataaaatatcc 1456 ccttccactt ctttctattt cactatcaca tttataattt tagtaacaaa a 1507	

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Thr Ala Ser Ala Ala Ala Gly Asn Pro Pro Gly Leu Asp Phe Val Ala 50 55 60	
Phe Ser Asp Gly Tyr Asp Asp Gly Leu Lys Pro Cys Gly Asp Gly Lys 65 70 75 80	
Arg Tyr Met Ser Glu Met Lys Ala Arg Gly Ser Glu Ala Leu Arg Asn 85 90 95	
Leu Leu Leu Asn Asn His Asp Val Thr Phe Val Val Tyr Ser His Leu 100 105 110	
Phe Ala Trp Ala Ala Glu Val Ala Arg Glu Ser Gln Val Pro Ser Ala 115 120 125	

Leu Leu Trp Val Glu Pro Ala Thr Val Leu Cys Ile Tyr Tyr Phe Tyr  
 130 135 140  
 Phe Asn Gly Tyr Ala Asp Glu Ile Asp Ala Gly Ser Asp Glu Ile Gln  
 145 150 155 160  
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 Leu Pro Glu Thr Pro Glu Arg Phe Arg Leu Met Met Lys Glu Lys Leu  
 180 185 190  
 Glu Thr Leu Asp Gly Glu Glu Lys Ala Lys Val Leu Val Asn Thr Phe  
 195 200 205  
 Asp Ala Leu Glu Pro Asp Ala Leu Thr Ala Ile Asp Arg Tyr Glu Leu  
 210 215 220  
 Ile Gly Ile Gly Pro Leu Ile Pro Ser Ala Phe Leu Asp Gly Gly Asp  
 225 230 235 240  
 Pro Ser Glu Thr Ser Tyr Gly Gly Asp Leu Phe Glu Lys Ser Glu Glu  
 245 250 255  
 Asn Asn Cys Val Glu Trp Leu Asp Thr Lys Pro Lys Ser Ser Val Val  
 260 265 270  
 Tyr Val Ser Phe Gly Ser Val Leu Arg Phe Pro Lys Ala Gln Met Glu  
 275 280 285  
 Glu Ile Gly Lys Gly Leu Leu Ala Cys Gly Arg Pro Phe Leu Trp Met  
 290 295 300  
 Ile Arg Glu Gln Lys Asn Asp Asp Gly Glu Glu Glu Glu Glu Leu  
 305 310 315 320  
 Ser Cys Ile Gly Glu Leu Lys Lys Met Gly Lys Ile Val Ser Trp Cys  
 325 330 335  
 Ser Gln Leu Glu Val Leu Ala His Pro Ala Leu Gly Cys Phe Val Thr  
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 His Cys Gly Trp Asn Ser Ala Val Glu Ser Leu Ser Cys Gly Val Pro  
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 Val Val Ala Val Pro Gln Trp Phe Asp Gln Thr Thr Asn Ala Lys Leu  
 370 375 380  
 Ile Glu Asp Ala Trp Gly Thr Gly Val Arg Val Arg Met Asn Glu Gly  
 385 390 395 400  
 Gly Gly Val Asp Gly Ser Glu Ile Glu Arg Cys Val Glu Met Val Met  
 405 410 415  
 Asp Gly Gly Glu Lys Ser Lys Leu Val Arg Glu Asn Ala Ile Lys Trp  
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aag aga ctc cta aaa gcc ggc act gac gtc acg ttt ttc acg acg gtt 148
Lys Arg Leu Leu Lys Ala Gly Thr Asp Val Thr Phe Phe Thr Ser Val
25          30          35          40

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tat gca tgg cgc cgc atg gcc aac aca gcc tcc gcc gct gcc gga aac 196  
Tyr Ala Trp Arg Arg Met Ala Asn Thr Ala Ser Ala Ala Ala Gly Asn  
45 50 55

cca ccg ggc ctc gac ttc gtg gcg ttc tcc gac ggc tac gac gac gac ggg 244  
 Pro Pro Gly Leu Asp Phe Val Ala Phe Ser Asp Gly Tyr Asp Asp Gly  
                  60                 65                         70

ctg aag ccc ggc ggc gac ggg aag cgc tac atg tcc gag atg aaa gcc 292  
 Leu Lys Pro Gly Gly Asp Gly Lys Arg Tyr Met Ser Glu Met Lys Ala  
 75 80 85

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cgc ggc tcc gag gcc tta aga   aac ctc ctt ctc aac aac gac gac gtc  340
Arg Gly Ser Glu Ala Leu Arg  Asn Leu Leu Leu Asn Asn Asp Asp Val
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 Arg Leu Ser His Val Pro Thr Ala Leu Leu Trp Val Glu Pro Ala Thr  
 125 130 135

gtg ctg tgc ata tac cac ttc tac ttc aac ggc tac gca gac gag atc 484  
 Val Leu Cys Ile Tyr His Phe Tyr Phe Asn Gly Tyr Ala Asp Glu Ile  
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155          160          165

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cag cgc agt ctt ccg acg ttt ctg ctg cct gcg acg ccg gag aga ttc 580  
 Gln Arg Ser Leu Pro Thr Phe Leu Leu Pro Ala Thr Pro Glu Arg Phe  
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cggttgatgatgaaagagaaactttagacgttgaaagaaag 628
Arg Leu Met Met Lys Glu Lys Leu Glu Thr Leu Asp Gly Glu Glu Lys
185 190 195 200

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acg gct att gat agg tat gag ttg atc ggg atc ggg ccg ttg att ccc			724
Thr Ala Ile Asp Arg Tyr Glu Leu Ile Gly Ile Gly Pro Leu Ile Pro			
220	225	230	
tcc gcc ttc ttg gac ggc gaa gat ccc tcc gaa acg tct tac ggc ggc			772
Ser Ala Phe Leu Asp Gly Glu Asp Pro Ser Glu Thr Ser Tyr Gly Gly			
235	240	245	
gat ctt ttc gaa aaa tcg gag gag aat aac tgc gtg gag tgg ttg aac			820
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250	255	260	
tcg aag ccg aaa tct tcg gtg gtg tat gtg tcg ttt ggg agc gtt ttg			868
Ser Lys Pro Lys Ser Ser Val Val Tyr Val Ser Phe Gly Ser Val Leu			
265	270	275	280
agg ttt cca aag gca caa atg gaa gag att ggg aaa ggg cta tta gcc			916
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285	290	295	
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Cys Gly Arg Pro Phe Leu Trp Met Ile Arg Glu Gln Lys Asn Asp Asp			
300	305	310	
ggc gaa gaa gaa gaa gaa gaa gag ttg agt tgc att ggg gaa ttg			1012
Gly Glu Glu Glu Glu Glu Leu Ser Cys Ile Gly Glu Leu			
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aaa aaa atg ggg aaa ata gtg tcg tgg tgc tcg cag ttg gag gtt ctg			1060
Lys Lys Met Gly Lys Ile Val Ser Trp Cys Ser Gln Leu Glu Val Leu			
330	335	340	
gcg cac cct gcg ttg gga tgt ttc gtg acg cat tgt ggg tgg aac tcg			1108
Ala His Pro Ala Leu Gly Cys Phe Val Thr His Cys Gly Trp Asn Ser			
345	350	355	360
gct gtg gag agc ttg agt tgc ggg att ccg gtg gtg gcg gtg ccg cag			1156
Ala Val Glu Ser Leu Ser Cys Gly Ile Pro Val Val Ala Val Pro Gln			
365	370	375	
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Trp Phe Asp Gln Thr Thr Asn Ala Lys Leu Ile Glu Asp Ala Trp Gly			
380	385	390	
aca ggg gtg aga gtg aga atg aat gaa ggg ggt ggg gtt gat gga tgt			1252
Thr Gly Val Arg Val Arg Met Asn Glu Gly Gly Val Asp Gly Cys			
395	400	405	
gag ata gaa agg tgt gtg gag atg gtg atg gat ggg ggt gac aag acc			1300
Glu Ile Glu Arg Cys Val Glu Met Val Met Asp Gly Gly Asp Lys Thr			
410	415	420	
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Lys Leu Val Arg Glu Asn Ala Ile Lys Trp Lys Thr Leu Ala Arg Gln			
425	430	435	440
gcc atg gga taggatggat cttcactcaa caatctcaac gcctttcttc			1397
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1474

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Asp Val Thr Phe Phe Thr Ser Val Tyr Ala Trp Arg Arg Met Ala Asn  
35 40 45  
Thr Ala Ser Ala Ala Ala Gly Asn Pro Pro Gly Leu Asp Phe Val Ala  
50 55 60  
Phe Ser Asp Gly Tyr Asp Asp Gly Leu Lys Pro Gly Gly Asp Gly Lys  
65 70 75 80  
Arg Tyr Met Ser Glu Met Lys Ala Arg Gly Ser Glu Ala Leu Arg Asn  
85 90 95  
Leu Leu Leu Asn Asn Asp Asp Val Thr Phe Val Val Tyr Ser His Leu  
100 105 110  
Phe Ala Trp Ala Ala Glu Val Ala Arg Leu Ser His Val Pro Thr Ala  
115 120 125  
Leu Leu Trp Val Glu Pro Ala Thr Val Leu Cys Ile Tyr His Phe Tyr  
130 135 140  
Phe Asn Gly Tyr Ala Asp Glu Ile Asp Ala Gly Ser Asn Glu Ile Gln  
145 150 155 160  
Leu Pro Arg Leu Pro Ser Leu Glu Gln Arg Ser Leu Pro Thr Phe Leu  
165 170 175  
Leu Pro Ala Thr Pro Glu Arg Phe Arg Leu Met Met Lys Glu Lys Leu  
180 185 190  
Glu Thr Leu Asp Gly Glu Glu Lys Ala Lys Val Leu Val Asn Thr Phe  
195 200 205  
Asp Ala Leu Glu Pro Asp Ala Leu Thr Ala Ile Asp Arg Tyr Glu Leu  
210 215 220  
Ile Gly Ile Gly Pro Leu Ile Pro Ser Ala Phe Leu Asp Gly Glu Asp  
225 230 235 240  
Pro Ser Glu Thr Ser Tyr Gly Gly Asp Leu Phe Glu Lys Ser Glu Glu  
245 250 255  
Asn Asn Cys Val Glu Trp Leu Asn Ser Lys Pro Lys Ser Ser Val Val  
260 265 270  
Tyr Val Ser Phe Gly Ser Val Leu Arg Phe Pro Lys Ala Gln Met Glu  
275 280 285

Glu Ile Gly Lys Gly Leu Leu Ala Cys Gly Arg Pro Phe Leu Trp Met  
 290 295 300  
 Ile Arg Glu Gln Lys Asn Asp Asp Gly Glu Glu Glu Glu Glu  
 305 310 315 320  
 Glu Leu Ser Cys Ile Gly Glu Leu Lys Lys Met Gly Lys Ile Val Ser  
 325 330 335  
 Trp Cys Ser Gln Leu Glu Val Leu Ala His Pro Ala Leu Gly Cys Phe  
 340 345 350  
 Val Thr His Cys Gly Trp Asn Ser Ala Val Glu Ser Leu Ser Cys Gly  
 355 360 365  
 Ile Pro Val Val Ala Val Pro Gln Trp Phe Asp Gln Thr Thr Asn Ala  
 370 375 380  
 Lys Leu Ile Glu Asp Ala Trp Gly Thr Gly Val Arg Val Arg Met Asn  
 385 390 395 400  
 Glu Gly Gly Val Asp Gly Cys Glu Ile Glu Arg Cys Val Glu Met  
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 Thr Phe Pro Ala Gln Gly His Ile Asn Pro Ala Leu Gln Phe Ala Lys  
 10 15 20 25  
 cgt ctc gca aat gcc gac att caa gtc aca ttc ttc acc agc gtc tac 148  
 Arg Leu Ala Asn Ala Asp Ile Gln Val Thr Phe Phe Thr Ser Val Tyr  
 30 35 40  
 gca tgg cgc cgc atg tcc aga acc gcc gct ggc tca aac ggg ctc atc 196  
 Ala Trp Arg Arg Met Ser Arg Thr Ala Ala Gly Ser Asn Gly Leu Ile  
 45 50 55  
 aat ttt gtg tcg ttt tcc gac ggg tat gac gac ggg tta cag ccc gga 244  
 Asn Phe Val Ser Phe Ser Asp Gly Tyr Asp Asp Gly Leu Gln Pro Gly  
 60 65 70  
 gac gat ggg aag aac tac atg tcg gag atg aaa agc aga ggt ata aaa 292  
 Asp Asp Gly Lys Asn Tyr Met Ser Glu Met Lys Ser Arg Gly Ile Lys

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gga agc ttc gtt aat acg acg aag tcg caa atg gaa gag ata gca aga Gly Ser Phe Val Asn Thr Thr Lys Ser Gln Met Glu Glu Ile Ala Arg 285 290 295 916			
ggg ctg tta gat tgt ggg agg ccg ttt ttg tgg gtg gta aga gta aac Gly Leu Leu Asp Cys Gly Arg Pro Phe Leu Trp Val Val Arg Val Asn 300 305 310 964			
gaa gga gaa gag gta ttg ata agt tgc atg gag gag ttg aaa cga gtg Glu Gly Glu Glu Val Leu Ile Ser Cys Met Glu Glu Leu Lys Arg Val 315 320 325 1012			
ggg aaa att gta tct tgg tgt tct caa ttg gaa gtc ctg acg cat ccc			1060

Gly Lys Ile Val Ser Trp Cys Ser Gln Leu Glu Val Leu Thr His Pro			
330	335	340	345
tcg ttg gga tgt ttc gtg aca cac tgc ggg tgg aat tcg act cta gag			1108
Ser Leu Gly Cys Phe Val Thr His Cys Gly Trp Asn Ser Thr Leu Glu			
350	355	360	
agt ata tct ttc ggg gtt ccg atg gtg gct ttt ccg cag tgg ttc gat			1156
Ser Ile Ser Phe Gly Val Pro Met Val Ala Phe Pro Gln Trp Phe Asp			
365	370	375	
caa ggg acg aat gcg aag ctg atg gag gat gtg tgg agg acg ggt gtg			1204
Gln Gly Thr Asn Ala Lys Leu Met Glu Asp Val Trp Arg Thr Gly Val			
380	385	390	
aga gtg aga gct aat gag gag ggt agc gtc gtt gat ggt gat gaa att			1252
Arg Val Arg Ala Asn Glu Glu Gly Ser Val Val Asp Gly Asp Glu Ile			
395	400	405	
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Arg Arg Cys Ile Glu Glu Val Met Asp Gly Gly Glu Lys Ser Arg Lys			
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Leu Arg Glu Ser Ala Gly Lys Trp Lys Asp Leu Ala Arg Lys Ala Met			
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Val Val Gly Ile			
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gactaacttt gtacaaaatg aaaagttata tgatgaaatt ttaaaaaaaca aactcagaca			1868
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 <212> PRT  
 <213> Verbena hybrida

<400> 6  
 Met Ser Arg Ala His Val Leu Leu Ala Thr Phe Pro Ala Gln Gly His  
 1 5 10 15  
 Ile Asn Pro Ala Leu Gln Phe Ala Lys Arg Leu Ala Asn Ala Asp Ile  
 20 25 30  
 Gln Val Thr Phe Phe Thr Ser Val Tyr Ala Trp Arg Arg Met Ser Arg  
 35 40 45  
 Thr Ala Ala Gly Ser Asn Gly Leu Ile Asn Phe Val Ser Phe Ser Asp  
 50 55 60  
 Gly Tyr Asp Asp Gly Leu Gln Pro Gly Asp Asp Gly Lys Asn Tyr Met  
 65 70 75 80  
 Ser Glu Met Lys Ser Arg Gly Ile Lys Ala Leu Ser Asp Thr Leu Ala  
 85 90 95  
 Ala Asn Asn Val Asp Gln Lys Ser Ser Lys Ile Thr Phe Val Val Tyr  
 100 105 110  
 Ser His Leu Phe Ala Trp Ala Ala Lys Val Ala Arg Glu Phe His Leu  
 115 120 125  
 Arg Ser Ala Leu Leu Trp Ile Glu Pro Ala Thr Val Leu Asp Ile Phe  
 130 135 140  
 Tyr Phe Tyr Phe Asn Gly Tyr Ser Asp Glu Ile Asp Ala Gly Ser Asp  
 145 150 155 160  
 Ala Ile His Leu Pro Gly Gly Leu Pro Val Leu Ala Gln Arg Asp Leu  
 165 170 175  
 Pro Ser Phe Leu Leu Pro Ser Thr His Glu Arg Phe Arg Ser Leu Met  
 180 185 190  
 Lys Glu Lys Leu Glu Thr Leu Glu Gly Glu Lys Pro Lys Val Leu  
 195 200 205  
 Val Asn Ser Phe Asp Ala Leu Glu Pro Asp Ala Leu Lys Ala Ile Asp  
 210 215 220  
 Lys Tyr Glu Met Ile Ala Ile Gly Pro Leu Ile Pro Ser Ala Phe Leu  
 225 230 235 240  
 Asp Gly Lys Asp Pro Ser Asp Arg Ser Phe Gly Gly Asp Leu Phe Glu  
 245 250 255  
 Lys Gly Ser Asn Asp Asp Asp Cys Leu Glu Trp Leu Ser Thr Asn Pro  
 260 265 270  
 Arg Ser Ser Val Val Tyr Val Ser Phe Gly Ser Phe Val Asn Thr Thr  
 275 280 285  
 Lys Ser Gln Met Glu Glu Ile Ala Arg Gly Leu Leu Asp Cys Gly Arg  
 290 295 300  
 Pro Phe Leu Trp Val Val Arg Val Asn Glu Gly Glu Glu Val Leu Ile  
 305 310 315 320  
 Ser Cys Met Glu Glu Leu Lys Arg Val Gly Lys Ile Val Ser Trp Cys  
 325 330 335

Ser Gln Leu Glu Val Leu Thr His Pro Ser Leu Gly Cys Phe Val Thr  
 340 345 350  
 His Cys Gly Trp Asn Ser Thr Leu Glu Ser Ile Ser Phe Gly Val Pro  
 355 360 365  
 Met Val Ala Phe Pro Gln Trp Phe Asp Gln Gly Thr Asn Ala Lys Leu  
 370 375 380  
 Met Glu Asp Val Trp Arg Thr Gly Val Arg Val Arg Ala Asn Glu Glu  
 385 390 395 400  
 Gly Ser Val Val Asp Gly Asp Glu Ile Arg Arg Cys Ile Glu Glu Val  
 405 410 415  
 Met Asp Gly Gly Glu Lys Ser Arg Lys Leu Arg Glu Ser Ala Gly Lys  
 420 425 430  
 Trp Lys Asp Leu Ala Arg Lys Ala Met Glu Glu Asp Gly Ser Ser Val  
 435 440 445  
 Asn Asn Leu Lys Val Phe Leu Asp Glu Val Val Gly Ile  
 450 455 460

<210> 7  
 <211> 1671  
 <212> DNA  
 <213> Torenia hybrira

<220>  
 <221> CDS  
 <222> (45)..(1478)

<220>  
 <221> misc\_feature  
 <222> (64)  
 <223> Amino acid 64 is Xaa wherein Xaa = Cys or Phe.

<220>  
 <221> misc\_feature  
 <222> (65)  
 <223> Amino acid 65 is Xaa wherein Xaa = Ser or Pro.

<400> 7  
 aacacataaa aaaaaaaataa aagaagaaat aattaaaaaa aaaa atg gtt aac aaa 56  
 Met Val Asn Lys  
 1

cgc cat att cta cta gca aca ttc cca gca caa ggc cac ata aac cct 104  
 Arg His Ile Leu Leu Ala Thr Phe Pro Ala Gln Gly His Ile Asn Pro  
 5 10 15 20

tct ctc gag ttc gcc aaa agg ctc ctc aac acc gga tac gtc gac caa 152  
 Ser Leu Glu Phe Ala Lys Arg Leu Leu Asn Thr Gly Tyr Val Asp Gln  
 25 30 35

gtc aca ttc ttc acg agt gta tac gca ttg aga cgc atg cgc ttc gaa 200  
 Val Thr Phe Phe Thr Ser Val Tyr Ala Leu Arg Arg Met Arg Phe Glu  
 40 45 50

acc gat ccg agc agc aga atc gat ttc gtg gca tkt yca gat tct tac 248  
 Thr Asp Pro Ser Ser Arg Ile Asp Phe Val Ala Xaa Xaa Asp Ser Tyr

55	60	65	
gat gat ggc tta aag aaa ggc gac gat ggc aaa aac tac atg tcg gag			296
Asp Asp Gly Leu Lys Lys Gly Asp Asp Gly Lys Asn Tyr Met Ser Glu			
70	75	80	
atg aga aag cgc gga acg aag gcc tta aag gac act ctt att aag ctc			344
Met Arg Lys Arg Gly Thr Lys Ala Leu Lys Asp Thr Leu Ile Lys Leu			
85	90	95	100
aac gat gct gcg atg gga agt gaa tgt tac aat cgc gtg agc ttt gtg			392
Asn Asp Ala Ala Met Gly Ser Glu Cys Tyr Asn Arg Val Ser Phe Val			
105	110	115	
gtg tac tct cat cta ttt tcg tgg gca gct gaa gtg gcg cgt gaa gtc			440
Val Tyr Ser His Leu Phe Ser Trp Ala Ala Glu Val Ala Arg Glu Val			
120	125	130	
gac gtg ccg agt gcc ctt ctt tgg att gaa ccg gct acg gtt ttc gat			488
Asp Val Pro Ser Ala Leu Leu Trp Ile Glu Pro Ala Thr Val Phe Asp			
135	140	145	
gtg tac tat ttt tac ttc aat ggg tat gcc gat gat atc gat gcg ggc			536
Val Tyr Tyr Phe Tyr Phe Asn Gly Tyr Ala Asp Asp Ile Asp Ala Gly			
150	155	160	
tca gat caa atc caa ctg ccc aat ctt ccg cag ctc tcc aag caa gat			584
Ser Asp Gin Ile Gln Leu Pro Asn Leu Pro Gln Leu Ser Lys Gln Asp			
165	170	175	180
ctc ccc tct ttc cta ctc cct tcg agc ccc gcg aga ttc cga acc cta			632
Leu Pro Ser Phe Leu Leu Pro Ser Ser Pro Ala Arg Phe Arg Thr Leu			
185	190	195	
atg aaa gaa aag ttc gac acg ctc gac aaa gaa ccg aaa gcg aag gtc			680
Met Lys Glu Lys Phe Asp Thr Leu Asp Lys Glu Pro Lys Ala Lys Val			
200	205	210	
ttg ata aac acg ttc gac gca tta gaa acc gaa caa ctc aaa gcc atc			728
Leu Ile Asn Thr Phe Asp Ala Leu Glu Thr Glu Gln Leu Lys Ala Ile			
215	220	225	
gac agg tat gaa cta ata tcc atc ggc cca tta atc cca tca tcg ata			776
Asp Arg Tyr Glu Leu Ile Ser Ile Gly Pro Leu Ile Pro Ser Ser Ile			
230	235	240	
ttc tca gat ggc aac gac ccc tca tca agc aac aaa tcc tac ggt gga			824
Phe Ser Asp Gly Asn Asp Pro Ser Ser Asn Lys Ser Tyr Gly Gly			
245	250	255	260
gac ctc ttc aga aaa gcc gat gaa act tac atg gac tgg cta aac tca			872
Asp Leu Phe Arg Lys Ala Asp Glu Thr Tyr Met Asp Trp Leu Asn Ser			
265	270	275	
aaa ccc gaa tca tcg gtc gtt tac gtt tcg ttc ggg agc ctc ctg agg			920
Lys Pro Glu Ser Ser Val Val Tyr Val Ser Phe Gly Ser Leu Leu Arg			
280	285	290	
ctc ccg aaa ccc caa atg gaa ata gca ata ggg ctt tca gac acc			968
Leu Pro Lys Pro Gln Met Glu Glu Ile Ala Ile Gly Leu Ser Asp Thr			
295	300	305	
aaa tcg cca gtt ctc tgg gtg ata aga aga aac gaa gag ggc gac gaa			1016

Lys Ser Pro Val Leu Trp Val Ile Arg Arg Asn Glu Glu Gly Asp Glu			
310	315	320	
caa gag caa gca gaa gaa gag aag ctg ctg agc ttc ttt gat cgt			1064
Gln Glu Gln Ala Glu Glu Glu Lys Leu Leu Ser Phe Phe Asp Arg			
325	330	335	340
cac gga act gaa cga ctc ggg aaa atc gtg aca tgg tgc tca caa ttg			1112
His Gly Thr Glu Arg Leu Gly Lys Ile Val Thr Trp Cys Ser Gln Leu			
345	350	355	
gat gtt ctg acg cat aag tcg gtg gga tgc ttc gtg acg cat tgc ggt			1160
Asp Val Leu Thr His Lys Ser Val Gly Cys Phe Val Thr His Cys Gly			
360	365	370	
tgg aat tct gct atc gag agc ctg gct tgt ggt gtg ccc gtg gtg tgc			1208
Trp Asn Ser Ala Ile Glu Ser Leu Ala Cys Gly Val Pro Val Val Cys			
375	380	385	
ttt cct caa tgg ttc gat caa ggg act aat gcg aag atg atc gaa gat			1256
Phe Pro Gln Trp Phe Asp Gln Gly Thr Asn Ala Lys Met Ile Glu Asp			
390	395	400	
gtg tgg agg agt ggt gtg aga gtc aga gtg aat gag gaa ggc ggc gtt			1304
Val Trp Arg Ser Gly Val Arg Val Arg Val Asn Glu Glu Gly Gly Val			
405	410	415	420
gtt gat agg cgt gag att aag agg tgc gtc tcg gag gtt ata aag agt			1352
Val Asp Arg Arg Glu Ile Lys Arg Cys Val Ser Glu Val Ile Lys Ser			
425	430	435	
cga gag ttg aga gaa agc gca atg atg tgg aag ggt ttg gct aaa gaa			1400
Arg Glu Leu Arg Glu Ser Ala Met Met Trp Lys Gly Leu Ala Lys Glu			
440	445	450	
gct atg gat gaa gaa cgt gga tca tca atg aac aat ctg aag aat ttt			1448
Ala Met Asp Glu Glu Arg Gly Ser Ser Met Asn Asn Leu Lys Asn Phe			
455	460	465	
att act agg att att aat gaa aat gcc tca taagttgtac tatatatgtt			1498
Ile Thr Arg Ile Ile Asn Glu Asn Ala Ser			
470	475		
attatttttg ttatggacgt cgaattaagt attagttaaa tgatatgtat tttagaggaag			1558
gccaaaacgg gctacacccg gcaggccacg ggttgaaaaa gccccccatg atttaaaaata			1618
tatattttaa aataaatatt ttctactatt aaactaaaaa aaaaaaaaaa aaa			1671
<210> 8			
<211> 478			
<212> PRT			
<213> Torenia hybrira			
<400> 8			
Met Val Asn Lys Arg His Ile Leu Leu Ala Thr Phe Pro Ala Gln Gly			
1	5	10	15
His Ile Asn Pro Ser Leu Glu Phe Ala Lys Arg Leu Leu Asn Thr Gly			
20	25	30	
Tyr Val Asp Gln Val Thr Phe Phe Thr Ser Val Tyr Ala Leu Arg Arg			

35	40	45
Met Arg Phe Glu Thr Asp Pro Ser Ser Arg Ile Asp Phe Val Ala Xaa		
50	55	60
Xaa Asp Ser Tyr Asp Asp Gly Leu Lys Lys Gly Asp Asp Gly Lys Asn		
65	70	75
Tyr Met Ser Glu Met Arg Lys Arg Gly Thr Lys Ala Leu Lys Asp Thr		
85	90	95
Leu Ile Lys Leu Asn Asp Ala Ala Met Gly Ser Glu Cys Tyr Asn Arg		
100	105	110
Val Ser Phe Val Val Tyr Ser His Leu Phe Ser Trp Ala Ala Glu Val		
115	120	125
Ala Arg Glu Val Asp Val Pro Ser Ala Leu Leu Trp Ile Glu Pro Ala		
130	135	140
Thr Val Phe Asp Val Tyr Tyr Phe Tyr Phe Asn Gly Tyr Ala Asp Asp		
145	150	155
Ile Asp Ala Gly Ser Asp Gln Ile Gln Leu Pro Asn Leu Pro Gln Leu		
165	170	175
Ser Lys Gln Asp Leu Pro Ser Phe Leu Leu Pro Ser Ser Pro Ala Arg		
180	185	190
Phe Arg Thr Leu Met Lys Glu Lys Phe Asp Thr Leu Asp Lys Glu Pro		
195	200	205
Lys Ala Lys Val Leu Ile Asn Thr Phe Asp Ala Leu Glu Thr Glu Gln		
210	215	220
Leu Lys Ala Ile Asp Arg Tyr Glu Leu Ile Ser Ile Gly Pro Leu Ile		
225	230	235
Pro Ser Ser Ile Phe Ser Asp Gly Asn Asp Pro Ser Ser Ser Asn Lys		
245	250	255
Ser Tyr Gly Gly Asp Leu Phe Arg Lys Ala Asp Glu Thr Tyr Met Asp		
260	265	270
Trp Leu Asn Ser Lys Pro Glu Ser Ser Val Val Tyr Val Ser Phe Gly		
275	280	285
Ser Leu Leu Arg Leu Pro Lys Pro Gln Met Glu Glu Ile Ala Ile Gly		
290	295	300
Leu Ser Asp Thr Lys Ser Pro Val Leu Trp Val Ile Arg Arg Asn Glu		
305	310	315
320		
Glu Gly Asp Glu Gln Glu Gln Ala Glu Glu Glu Lys Leu Leu Ser		
325	330	335
Phe Phe Asp Arg His Gly Thr Glu Arg Leu Gly Lys Ile Val Thr Trp		
340	345	350
Cys Ser Gln Leu Asp Val Leu Thr His Lys Ser Val Gly Cys Phe Val		
355	360	365
Thr His Cys Gly Trp Asn Ser Ala Ile Glu Ser Leu Ala Cys Gly Val		

370

375

380

Pro Val Val Cys Phe Pro Gln Trp Phe Asp Gln Gly Thr Asn Ala Lys  
 385 390 395 400

Met Ile Glu Asp Val Trp Arg Ser Gly Val Arg Val Arg Val Asn Glu  
 405 410 415

Glu Gly Gly Val Val Asp Arg Arg Glu Ile Lys Arg Cys Val Ser Glu  
 420 425 430

Val Ile Lys Ser Arg Glu Leu Arg Glu Ser Ala Met Met Trp Lys Gly  
 435 440 445

Leu Ala Lys Glu Ala Met Asp Glu Glu Arg Gly Ser Ser Met Asn Asn  
 450 455 460

Leu Lys Asn Phe Ile Thr Arg Ile Ile Asn Glu Asn Ala Ser  
 465 470 475

&lt;210&gt; 9

&lt;211&gt; 1437

&lt;212&gt; DNA

&lt;213&gt; Perilla frutescens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (294)..(1298)

&lt;400&gt; 9

tccaaaactc ataacgtgat tgagctaattg tgcacatctt cctcttcaaa gtctacagt 60

tcatcctacc agcatcatca tgatcaatct ctttataatg aggagaatgg agtaacaagg 120

agtgggtttt gttactcagc ttcaacctac gtacgtacta ctactgactc aactctcaag 180

agaatgaata taatatataa tggcgatag atctttgtat atatgttagt gtagcctgca 240

ggtgttaat taatttccgg tgtggaaaaa taaataaata aataaaatata gcg atg 296  
 Met  
 1

agc agc agc agc aga agg tgg aga gag aat gag ggg atg cga agg 344  
 Ser Ser Ser Ser Arg Arg Trp Arg Glu Asn Glu Gly Met Arg Arg  
 5 10 15

aca ttg ctg ggg ttg ggt ttg ggg cag ttg gtt tct ttc gat ttg gct 392  
 Thr Leu Leu Gly Leu Gly Leu Gly Gln Leu Val Ser Phe Asp Leu Ala  
 20 25 30

atc atg acc ttt tct gct tct ttg gtt tca acc aca gtg gat gca cca 440  
 Ile Met Thr Phe Ser Ala Ser Leu Val Ser Thr Thr Val Asp Ala Pro  
 35 40 45

ctt act atg tcg ttc act aca tac act gtt gtg gcc ctg ctc tat gga 488  
 Leu Thr Met Ser Phe Thr Thr Tyr Thr Val Val Ala Leu Leu Tyr Gly  
 50 55 60 65

acc atc ttg ctt tac cgc cgc cac aaa ttc ttg gtt cca tgg tac tgg 536  
 Thr Ile Leu Leu Tyr Arg Arg His Lys Phe Leu Val Pro Trp Tyr Trp  
 70 75 80

tat gct ctc ctg ggg ttc gtg gac gtc cac ggc aat tat ctt gtt aat Tyr Ala Leu Leu Gly Phe Val Asp Val His Gly Asn Tyr Leu Val Asn 85 90 95	584
aaa gca ttc gag ttg aca tcg att acg agt gtg agc ata ctg gat tgt Lys Ala Phe Glu Leu Thr Ser Ile Thr Ser Val Ser Ile Leu Asp Cys 100 105 110	632
tgg aca atc gtg tgg tcc atc atc ttt aca tgg atg ttc cta ggc aca Trp Thr Ile Val Trp Ser Ile Ile Phe Thr Trp Met Phe Leu Gly Thr 115 120 125	680
aaa tac tct gta tac cag ttt gtc ggt gct gct att tgt gta gga ggc Lys Tyr Ser Val Tyr Gln Phe Val Gly Ala Ala Ile Cys Val Gly Gly 130 135 140 145	728
ctc ctc ctc gtg ctt ctt tcc gac tca ggg gtc act gct gct ggt tcg Leu Leu Leu Val Leu Leu Ser Asp Ser Gly Val Thr Ala Ala Gly Ser 150 155 160	776
aat cct ctt ttg ggt gat ttt ctt gtc ata aca ggc tct att ttg ttc Asn Pro Leu Leu Gly Asp Phe Leu Val Ile Thr Gly Ser Ile Leu Phe 165 170 175	824
aca ctc agc act gtt ggt cag gaa tac tgc gtg aag agg aaa gat cgt Thr Leu Ser Thr Val Gly Gln Glu Tyr Cys Val Lys Arg Lys Asp Arg 180 185 190	872
att gaa gta gta gca atg atc ggt gta ttt ggt atg ctc atc agt gca Ile Glu Val Val Ala Met Ile Gly Val Phe Gly Met Leu Ile Ser Ala 195 200 205	920
acc gag att act gtg ctg gag agg aat gcc ctc tca tca atg cag tgg Thr Glu Ile Thr Val Leu Glu Arg Asn Ala Leu Ser Ser Met Gln Trp 210 215 220 225	968
tct act gga ctt ttg gca gcc tat gtt gtt tat gca ctg tcc agc ttc Ser Thr Gly Leu Leu Ala Ala Tyr Val Val Tyr Ala Leu Ser Ser Phe 230 235 240	1016
ctc ttc tgc aca ctc acc cct ttt ctt ctc aag atg agt ggc gct gca Leu Phe Cys Thr Leu Thr Pro Phe Leu Leu Lys Met Ser Gly Ala Ala 245 250 255	1064
ttt ttc aat ctt tcc atg ctt aca tct gat atg tgg gct gtt gca att Phe Phe Asn Leu Ser Met Leu Thr Ser Asp Met Trp Ala Val Ala Ile 260 265 270	1112
agg aca ttc ata tac aac cag gag gtt gat tgg tta tac tat ttg gcc Arg Thr Phe Ile Tyr Asn Gln Glu Val Asp Trp Leu Tyr Tyr Leu Ala 275 280 285	1160
ttt tgt ctc gtt gtt gga ata ttc ata tat aca aaa aca gag aag Phe Cys Leu Val Val Gly Ile Phe Ile Tyr Thr Lys Thr Glu Lys 290 295 300 305	1208
gat cct aac aat acg aga gcc ctt gag aat gga aac ttg gat cat gaa Asp Pro Asn Asn Thr Arg Ala Leu Glu Asn Gly Asn Leu Asp His Glu 310 315 320	1256
tat agt ctc ctt gag gat caa gat gac aca cca aga aaa cca Tyr Ser Leu Leu Glu Asp Gln Asp Asp Thr Pro Arg Lys Pro 325 330 335	1298

tagctagctt tgcccacaaat cttttcatca acagtttaa ataattcgtg agggggagag 1358  
agatcgagat actaattaat ggacgtctat tatatagttg gaggttttg ttttatttat 1418  
ttatggagt aaaaaaaaaa 1437

<210> 10  
<211> 335  
<212> PRT  
<213> *Perilla frutescens*

<400> 10  
Met Ser Ser Ser Ser Arg Arg Trp Arg Glu Asn Glu Gly Met Arg  
1 5 10 15  
Arg Thr Leu Leu Gly Leu Gly Gln Leu Val Ser Phe Asp Leu  
20 25 30  
Ala Ile Met Thr Phe Ser Ala Ser Leu Val Ser Thr Thr Val Asp Ala  
35 40 45  
Pro Leu Thr Met Ser Phe Thr Thr Tyr Thr Val Val Ala Leu Leu Tyr  
50 55 60  
Gly Thr Ile Leu Leu Tyr Arg Arg His Lys Phe Leu Val Pro Trp Tyr  
65 70 75 80  
Trp Tyr Ala Leu Leu Gly Phe Val Asp Val His Gly Asn Tyr Leu Val  
85 90 95  
Asn Lys Ala Phe Glu Leu Thr Ser Ile Thr Ser Val Ser Ile Leu Asp  
100 105 110  
Cys Trp Thr Ile Val Trp Ser Ile Ile Phe Thr Trp Met Phe Leu Gly  
115 120 125  
Thr Lys Tyr Ser Val Tyr Gln Phe Val Gly Ala Ala Ile Cys Val Gly  
130 135 140  
Gly Leu Leu Leu Val Leu Leu Ser Asp Ser Gly Val Thr Ala Ala Gly  
145 150 155 160  
Ser Asn Pro Leu Leu Gly Asp Phe Leu Val Ile Thr Gly Ser Ile Leu  
165 170 175  
Phe Thr Leu Ser Thr Val Gly Gln Glu Tyr Cys Val Lys Arg Lys Asp  
180 185 190  
Arg Ile Glu Val Val Ala Met Ile Gly Val Phe Gly Met Leu Ile Ser  
195 200 205  
Ala Thr Glu Ile Thr Val Leu Glu Arg Asn Ala Leu Ser Ser Met Gln  
210 215 220  
Trp Ser Thr Gly Leu Leu Ala Ala Tyr Val Val Tyr Ala Leu Ser Ser  
225 230 235 240  
Phe Leu Phe Cys Thr Leu Thr Pro Phe Leu Leu Lys Met Ser Gly Ala  
245 250 255  
Ala Phe Phe Asn Leu Ser Met Leu Thr Ser Asp Met Trp Ala Val Ala  
260 265 270

Ile Arg Thr Phe Ile Tyr Asn Gln Glu Val Asp Trp Leu Tyr Tyr Leu  
275 280 285

Ala Phe Cys Leu Val Val Val Gly Ile Phe Ile Tyr Thr Lys Thr Glu  
290 295 300

Lys Asp Pro Asn Asn Thr Arg Ala Leu Glu Asn Gly Asn Leu Asp His  
305 310 315 320

Glu Tyr Ser Leu Leu Glu Asp Gln Asp Asp Thr Pro Arg Lys Pro  
325 330 335

<210> 11

<211> 2105

<212> DNA

<213> Petunia hybrida

<220>

<221> CDS

<222> (341)..(1744)

<400> 11

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tttatgcttc cggctcgat gttgtgtgga atttgagcg gataacaatt tcacacagga 120  
aacagctatg accatgatta cgccaagctc gaaattaacc ctcactaaag ggaacaaaag 180  
ctggagctcc acgcgggtggc ggccgctcta gaactagtgg atccccggg ctgcaggaat 240  
tccgttgctg tcgcccacaat ttacaaacca agaaattaag catcccttc ccccccctaa 300  
aaaacataca agtttttaat ttttactaa gcaagaaaat atg gtg cag cct cat 355  
Met Val Gln Pro His  
1 5

gtc atc tta aca aca ttt cca gca caa ggc cat att aat cca gca ctt 403  
Val Ile Leu Thr Thr Phe Pro Ala Gln Gly His Ile Asn Pro Ala Leu  
10 15 20

caa ttt gcc aag aat ctt gtc aag atg ggc ata gaa gtg aca ttt tct 451  
Gin Phe Ala Lys Asn Leu Val Lys Met Gly Ile Glu Val Thr Phe Ser  
25 30 35

aca agc att tat gcc caa agc cgt atg gat gaa aaa tcc att ctt aat 499  
Thr Ser Ile Tyr Ala Gln Ser Arg Met Asp Glu Lys Ser Ile Leu Asn  
40 45 50

gca cca aaa gga ttg aat ttc att cca ttt tcc gat ggc ttt gat gaa 547  
Ala Pro Lys Gly Leu Asn Phe Ile Pro Phe Ser Asp Gly Phe Asp Glu  
55 60 65

ggt ttt gat cat tca aaa gac cct gta ttt tac atg tca caa ctt cgt 595  
Gly Phe Asp His Ser Lys Asp Pro Val Phe Tyr Met Ser Gln Leu Arg  
70 75 80 85

aaa tgt gga agt gaa act gtc aaa aaa ata att ctc act tgc tct gaa 643  
Lys Cys Gly Ser Glu Thr Val Lys Lys Ile Ile Leu Thr Cys Ser Glu  
90 95 100

aat gga cag cct ata act tgc cta ctt tac tcc att ttc ctt cct tgg 691  
Asn Gly Gln Pro Ile Thr Cys Leu Leu Tyr Ser Ile Phe Leu Pro Trp

105	110	115	
gca gca gag gta gca cgt gaa gtt cac atc cct tct gct ctt ctt tgg Ala Ala Glu Val Ala Arg Glu Val His Ile Pro Ser Ala Leu Leu Trp 120	125	130	739
agt caa cca gca aca ata ttg gac ata tat tac ttc aac ttt cat gga Ser Gln Pro Ala Thr Ile Leu Asp Ile Tyr Tyr Phe Asn Phe His Gly 135	140	145	787
tat gaa aaa gct atg gct aat gaa tcc aat gat cca aat tgg tcc att Tyr Glu Lys Ala Met Ala Asn Glu Ser Asn Asp Pro Asn Trp Ser Ile 150	155	160	835
caa ctt ccc ggg ctt cca cta ctg gaa act cga gat ctt cct tca ttt Gln Leu Pro Gly Leu Pro Leu Leu Glu Thr Arg Asp Leu Pro Ser Phe 170	175	180	883
tta ctt cct tat ggt gca aaa ggg agt ctt cga gtt gca ctt cca cca Leu Leu Pro Tyr Gly Ala Lys Gly Ser Leu Arg Val Ala Leu Pro Pro 185	190	195	931
ttc aaa gaa ttg ata gac aca tta gat gct gaa acc act cct aag att Phe Lys Glu Leu Ile Asp Thr Leu Asp Ala Glu Thr Thr Pro Lys Ile 200	205	210	979
ctt gtg aat aca ttt gat gaa tta gag cct gag gca ctc aat gca att Leu Val Asn Thr Phe Asp Glu Leu Glu Pro Glu Ala Leu Asn Ala Ile 215	220	225	1027
gaa ggt tat aag ttt tat gga att gga ccg ttg att cct tct gct ttc Glu Gly Tyr Lys Phe Tyr Gly Ile Gly Pro Leu Ile Pro Ser Ala Phe 230	235	240	1075
ttg ggt gga aat gac cct tta gat gct tca ttt ggt ggt gat ctt ttt Leu Gly Gly Asn Asp Pro Leu Asp Ala Ser Phe Gly Gly Asp Leu Phe 250	255	260	1123
caa aat tca aat gac tat atg gaa tgg tta aac tca aag cca aat tca Gln Asn Ser Asn Asp Tyr Met Glu Trp Leu Asn Ser Lys Pro Asn Ser 265	270	275	1171
tca gtt gtt tat ata tct ttt ggg agt cta atg aat cca tct att agc Ser Val Val Tyr Ile Ser Phe Gly Ser Leu Met Asn Pro Ser Ile Ser 280	285	290	1219
caa atg gag gag ata tca aaa ggg ttg ata gac ata gga agg ccg ttt Gln Met Glu Glu Ile Ser Lys Gly Leu Ile Asp Ile Gly Arg Pro Phe 295	300	305	1267
tta tgg gtg ata aaa gaa aat gaa aaa ggc aaa gaa gaa gag aat aaa Leu Trp Val Ile Lys Glu Asn Glu Lys Gly Lys Glu Glu Asn Lys 310	315	320	1315
aag ctt ggt tgt att gaa gaa ttg gaa aaa ata gga aaa ata gtt cca Lys Leu Gly Cys Ile Glu Glu Leu Glu Lys Ile Gly Lys Ile Val Pro 330	335	340	1363
tgg tgt tca caa ctt gaa gtt cta aaa cat cca tct tta gga tgt ttt Trp Cys Ser Gln Leu Glu Val Leu Lys His Pro Ser Leu Gly Cys Phe 345	350	355	1411
gtt tct cat tgt gga tgg aat tca gcc tta gag agt tta gct tgt gga			1459

Val Ser His Cys Gly Trp Asn Ser Ala Leu Glu Ser Leu Ala Cys Gly  
 360 365 370  
 gtg cca gtt gtg gca ttt cct caa tgg aca gat caa atg aca aat gcc 1507  
 Val Pro Val Val Ala Phe Pro Gln Trp Thr Asp Gln Met Thr Asn Ala  
 375 380 385  
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 Val Met Asp Gly Gly Glu Lys Gly Glu Leu Arg Lys Asn Ala Lys  
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 His Lys Asn Leu Lys Ala Phe Ile Asp Asp Val Ala Lys Gly Phe  
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 Glu Val Thr Phe Ser Thr Ser Ile Tyr Ala Gln Ser Arg Met Asp Glu  
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 Lys Ser Ile Leu Asn Ala Pro Lys Gly Leu Asn Phe Ile Pro Phe Ser  
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 Asp Gly Phe Asp Glu Gly Phe Asp His Ser Lys Asp Pro Val Phe Tyr  
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Met Ser Gln Leu Arg Lys Cys Gly Ser Glu Thr Val Lys Lys Ile Ile  
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 Leu Thr Cys Ser Glu Asn Gly Gln Pro Ile Thr Cys Leu Leu Tyr Ser  
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 Ile Phe Leu Pro Trp Ala Ala Glu Val Ala Arg Glu Val His Ile Pro  
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 Ser Ala Leu Leu Trp Ser Gln Pro Ala Thr Ile Leu Asp Ile Tyr Tyr  
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 Phe Asn Phe His Gly Tyr Glu Lys Ala Met Ala Asn Glu Ser Asn Asp  
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 Pro Asn Trp Ser Ile Gln Leu Pro Gly Leu Pro Leu Leu Glu Thr Arg  
 165 170 175  
 Asp Leu Pro Ser Phe Leu Leu Pro Tyr Gly Ala Lys Gly Ser Leu Arg  
 180 185 190  
 Val Ala Leu Pro Pro Phe Lys Glu Leu Ile Asp Thr Leu Asp Ala Glu  
 195 200 205  
 Thr Thr Pro Lys Ile Leu Val Asn Thr Phe Asp Glu Leu Glu Pro Glu  
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 Ala Leu Asn Ala Ile Glu Gly Tyr Lys Phe Tyr Gly Ile Gly Pro Leu  
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 Gly Gly Asp Leu Phe Gln Asn Ser Asn Asp Tyr Met Glu Trp Leu Asn  
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Ala Lys Gly Phe  
465